

1. (Twice Amended) A multilayer printed wiring board manufacturing apparatus, to be used for processing a multilayer printed wiring board having an interlayer resin insulator, comprising:

a processing laser source, a scanning head for deflecting a laser beam in X-Y directions, a camera for reading positioning marks covering the interlayer resin insulator of the multilayer printed wiring board, an X-Y table for placing the multilayer printed wiring board, an input section for inputting processing data of the multilayer printed wiring board, a memory section for storing the processing data or an arithmetic operations result and an arithmetic operating section, wherein the processing data is input from the input section and this processing data is stored in the memory section;

a position of a positioning mark of the multilayer printed wiring board placed on the X-Y table is measured with the camera;

the input processing data is corrected on the basis of the measured position of the positioning mark to generate X-Y table drive data in the arithmetic section and this drive data is then stored in the memory section; and

the drive data is read from the memory section and then the X-Y table and the scanning head are controlled in a control section and thereby the laser beam is radiated to the multilayer printed wiring board to eliminate the interlayer resin layer to form a hole for a via hole.

4. (Twice Amended) A multilayer printed wiring board manufacturing method comprising

(J) the steps of:

forming a positioning mark covered interlayer insulating agent layer and an interlayer insulating agent layer on a multilayer printed wiring board;

placing a multilayer printed wiring board having formed said positioning mark on an X-Y table of a multilayer printed wiring board manufacturing apparatus consisting of a processing laser source, a scanning head for deflecting a direction of a laser beam in X-Y directions, a camera for reading the positioning mark of the multilayer printed wiring board, an X-Y table for placing the multilayer printed wiring board, an input section for inputting processing data of the multilayer printed wiring board, a memory section for storing the processing data or an arithmetic operations result and an arithmetic operating section, and inputting process log data to this manufacturing apparatus:

measuring a position of the positioning mark of the multilayer printed wiring board with the camera, correcting the input processing data based on the measured positioning mark position to generate scanning head and X-Y table drive data in the arithmetic operating section and then storing this drive data in the memory section; and

reading the drive data from the memory section to control the X-Y table and the scanning head in a control section and radiating the laser beam to the multilayer printed wiring board to eliminate the interlayer resin layer to form a hole for a via hole.

5. (Twice Amended) A multilayer printed wiring board manufacturing apparatus comprising a CO₂ laser source, a scanning head for deflecting a direction of a laser beam in X-Y directions or an X-Y table for displacing a position of a multilayer printed wiring board, wherein the laser beam oscillated from said CO₂ laser source is converted to a beam of shortened wavelength by harmonic wave generating means, a diffraction of the laser beam is controlled, and the laser beam forms a via hole.

6. (Twice Amended) A multilayer printed wiring board manufacturing apparatus comprising a processing laser source, harmonic wave generating means for converting a laser beam oscillated from said processing laser source to a shortened wavelength beam of a second harmonic wave and a scanning head for deflecting a direction of the laser beam in X-Y directions or an X-Y table for displacing a position of a multilayer printed wiring board, wherein a wavelength of said processing laser source is between 720nm and a minimum wavelength of the laser source, or between 6000nm and a maximum wavelength of the laser source, and said processing laser source forms a via hole exposing a conductive in an interlayer resin.

11. (Twice Amended) A laser processing apparatus comprising a CO₂ laser source, a scanning head for deflecting a direction of a laser beam to X-Y directions or an X-Y table for displacing a position of a work piece to be processed, wherein the laser beam oscillated from said CO₂ laser source is converted to a shortened wavelength beam by harmonic wave generating means, a diffraction of the laser beam is controlled, and the laser beam forms a via hole.

C3
SVb
V3

12. (Twice Amended) A laser processing apparatus comprising a processing laser source, harmonic wave generating means for converting a laser beam oscillated from said processing laser source to a shortened wavelength beam of a second harmonic wave, and a scanning head for deflecting a direction of the laser beam to X-Y directions or an X-Y table for displacing a position of a work piece to be processed, wherein a wavelength of said processing laser source is between 720nm and a minimum wavelength of the laser source, or between 6000nm and a maximum wavelength of the laser source, and said processing laser source forms a via hole exposing a conductive in an interlayer resin layer.

See the attached Appendix for the changes made to effect the above claims.